Noise Management Plan

Brooke Energy Group Limited
Exeter Biofuel Preparation Facility

Prepared by:
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1. Introduction

This document forms the Noise Management Plan (NMP) for the operation of a solid biofuel preparation facility by Brooke Energy Group Limited at their site at Hill Barton Business Park, Clyst St Mary.

The document establishes a background (ambient) noise environment and identifies the key noise sources and noise sensitive receptors (NSR) associated with the proposed development.

The document also identifies the source and nature of each noise source along with the proposed control measures.

The site when operational will be regulated as a Part A(1) Installation by the Environmental Agency. Under the requirements of the permit, all environmental impacts (including noise) will need to be mitigated to the extent that it can be demonstrated not have any adverse impacts on the environment. This noise management plan therefore has been adopted by the site to ensure that these conditions can be met.

A detailed Noise Assessment of the proposed activities was carried out by Entran Limited in 2018 (provided in Annex A of this document). The conclusions of that assessment were that the sound environment at the closest noise-sensitive receptors to the site was not audibly or measurably influenced by the activities associated with the site and, as such, equated to a Low Impact in terms of BS4142 and a NOEL in terms of the PPG England definitions.

However, the EA, upon initial review of the permit application for the installation, have requested a NMP be implemented to ensure no adverse effects to the surrounding environment.

2. Potential Noise Sources

The layout of the installation has taken into account the potential impacts on the environmental and neighbouring receptors with regards to noise.

The plant have been designed to abate and control noise, odour, and fugitive emissions, and the processing yard is bound to the southeast by the Hill Barton Landfill, which acts as a large land bank aiding in disrupting the noise from the site toward sensitive receptors.

The potential noise emitting processing equipment located at the site are as follows:

- Sennebogen 821 electric grab loader for loading the primary shredder;
- Untha – XR3000C Primary Shredder, electric powered machine via a diesel generator;
- Terex Finlay 883+ trommel screen, currently diesel powered but a replacement electric powered trommel will be sourced;
- Eriez ECS Eddy Current Separator, electric powered machine via a diesel generator; and
- Anaconda FTR 150 hopper conveyor for transport of material between equipment.

3. Noise Abatement Measures

All key components identified in the table below have been specified to meet a noise specification such that the occupational noise exposure limits as defined by the EC Physical Agents Directives and their regulations (Control of Noise at Work Regulations 2005) are met.

As required by the above regulations the site has specified an occupational noise climate (i.e., internal noise levels) to be below the first action level of 80dBL.epd. This has been achieved by the equipment manufacturers using acoustic enclosures around all key noise generating equipment.

All associated external ancillary plant will be screened to the east by the landfill embankment (17m in height) and to the north by already existing industrial buildings and will only be operated intermittently and only during the daytime. The noise emanating from the external plant and equipment has been modelled, calculated, and provided. The noise impacts associated with the external shredding of wood waste will not give rise to offsite noise impacts.

Further significant screening is provided through the storage of waste piles on site.

It should be noted that processing equipment is currently mobile but is in the process of being transferred to a mains electric connection and fixed in place. Processed wood is stored in the appropriate storage bunker along the eastern boundary of the site.

The shredder on site and eddy current separator (ECS) are currently electric powered by a diesel generator, and the trommel is diesel powered. However, the electric plant are planned to be connected to a new onsite mains supply and an electric powered replacement trommel sourced so all processing plant can be placed in situ. A cover is then planned to be built over the processing line to further reduce noise emission risk.

The main mitigation measures are provided within Table 1 below:

Table 1: Noise Mitigation Measures

Component	Comment on Potential Noise Impact	Mitigation Action to be Taken
Diesel powered plant and equipment	The noise from the engine/generators and characteristic “whistle” from the exhaust could be audible at the nearest affected residential premises.	The site is in the process of replacing all outdoor diesel powered plant and equipment with electric alternatives. Operating hours are between 08:00 – 18:00 Monday to Saturday to mitigate impacts to sensitive receptors.
External HGV movements	The acoustic character associated with intermittent, impulsive, and tonal reversing beepers associated with HGVs reversing could be disturbing for residents.	HGVs Brooke control operating on the site will be fitted with “white noise” or smart revering signals, where this is possible to do so. External HGV movements will adhere to the consented hours of operation.

Mobile plant	Scraping of buckets and shovels on the ground when loading and moving around the site.	Only when loading from ground level will the buckets/shovels be at ground level. All other movements will be conducted with the bucket/shovel raised to avoid unnecessary noise emissions.

The identified noise generating plant and equipment associated with the Installation have been identified in Table 2 overleaf.

Table 2: Identified Noise Sources and Abatement						
Equipment	Description	Location of source	Nature of noise	Duration	Abatement fitted	Significant impact at NSR
Transportation and external vehicle movements	Vehicle engine and drive-train noise	Vehicle engine and drive-train noise	Intermittent occasional impact noises due to 'road bumps'	Short term	Road will be maintained in good order. All vehicles requested to observe site speed limits. Site layout has been selected to screen transportation noise as much as practically possible.	No, the deliveries and collections of waste will be limited to daytime hours only.
Reception and delivery	External vehicle noise	External	Intermittent plant noise	Short term	Significant screening from waste piles, buildings and boundary screening will occur.	No. All noise screened. Residential neighbours are located approximately 320m to the east of the site.
External processing plant and equipment	Primary shredder, trommel, conveyor, and separator with intermittent noise	External	Intermittent plant noise	Periodic (daytime only)	New electric shredder and as such is very quiet compared to conventional diesel-powered shredders.	No, all shredding will be carried out on a daytime only basis. The activities are approximately 320m from residential neighbours. Noise is largely screened by adjacent landfill bund (17m), buildings and piled wastes (4m).

4. Nearest Noise Sensitive Receptors

The site is located within the Hill Barton Industrial Estate and as such borders with other existing and operational industrial premises on all sides bar the landfill site to the southeast. Currently on the site are the existing equipment as operated by Brooke as an annex to the Brooke Part B regulated biomass fuelled CHP to the northwest.

The nearest noise sensitive receptors to the site are labelled on figure 1 below and detailed in table 3 overleaf.

Figure 1. Locations of noise sensitive receptors within 750m of the site.

Table 3: Noise sensitive human receptors within 750m of the site.		
Marker	Name	Distance and direction from site
R1	Houses on Stuart Way	400m SW
R2	Houses around Princes Cottage	330m SE
R3	Denbow Farm	435m N
R4	Glebe House	585m E
R5	Crealy Cottages	560m S
R6	Newhouse Farm	670m NW
R7	Little Hill Cottage	745m W

5. Background Noise Levels

The existing background noise levels expected at the residential premises located at Glebe House (MP1), Stuart Way (MP2), and at the eastern boundary of the site atop the embankment (MP3) were determined based upon the results of a noise measurements conducted by Entran Limited on 24th April 2018.

Based upon the results of the environmental noise survey, the Table 4 overleaf presents a summary of the typical weekday daytime and weekend daytime background noise levels, which shall be used to form the benchmark for the environmental noise assessment. Please refer to the noise assessment in Annex A for more information.

Table 4: Summary of noise measurement results.					
Location	Period	Noise Level, dB			
		$L_{Aeq,T}$	L_{A90}	L_{A10}	L_{AFMax}
MP1	Source On (10:30 – 16:40)*	49.9	47.0	51.5	64.4
	Source Off (10:15 – 10:30 and 13:00 – 13:30)	49.7	47.0	51.2	62.8
MP2	Source On (14:20 – 15:00)	54.3	49.0	56.3	68.9
	Source Off (05:30 – 06:30)	54.1	45.0	56.7	79.5
MP3	Source On (09:50 – 16:35)*	65.7	53.0 / 67.0	64.0	77.9
	Source Off (13:00 – 13:30)	60.0	54.0	61.8	77.3
*denotes, period between 13:00 – 13:30 excluded					

The noise assessment demonstrates that based upon the current site arrangement, activities associated with the process at the installation were entirely inaudible at all existing off-site receptor locations, as a result of the noise mitigating effects of the substantial earth bund to the east of the site boundary

and the baseline noise environment, which is influenced by the proliferation of commercial activities within the industrial estate.

This noise level excludes the mitigation measures mentioned within Table 1 which will only improve the background noise level.

Background noise levels are provided as part of the full noise assessment report, which has been submitted with the permit application.

6. Potential Impacts

The assessment has shown that noise from the operations of the Brooke site are not expected to have an adverse impact on any of the identified nearest noise sensitive premises and equates to a Low Impact in BS4142 terms and No Observed Effect (NOEL) in terms of the PPG England definitions.

7. Noise Monitoring

Noise will be checked as part of the daily site walkover checks.

In the event that excessive noise is identified, the operations on site will cease and the noise will be investigated.

8. Complaints

In the event of a noise complaint, operations on site will be assessed stopped and the complaint investigated. If there is a material issue then all procedures will be reviewed to investigate what machinery was being used at the time of the complaint.

The Noise Management Plan would then be reviewed for its effectiveness at mitigating noise and further mitigation measures included, if considered necessary.